

NORTH PACIFIC OCEAN, JANUARY 1940

By WILLIS E. HURD

Atmospheric pressure.—Most unusual and persistent conditions of low atmospheric pressure overspread the middle waters of the North Pacific during January 1940. While the center of the Aleutian Low occupied a normal position over or a little south of the Aleutian Islands, cyclonic conditions spread far to the southward, with the result that, even in the latitudes of Midway Island and Honolulu the customary winter anticyclone was, on the average, completely nonexistent. At Honolulu the average pressure of 1,011.2 millibars (29.86 inches) was 4.7 millibars (0.14 inch) below the normal of the month; while at Midway Island the average pressure of 1,007.7 millibars (29.76 inches) was 9.2 millibars (0.27 inch) below the normal, or the lowest of record there for any month during the past 29 years. Minus pressure departures, though in decreasing value, continued as far to the eastward as the west coast of the United States, and as far to the southwestward as about the 135th meridian of east longitude. The lowest barometer reported by any Pacific vessel this month was 967.1 millibars (28.56 inches) read on the Japanese motorship *Amagisan Maru* on the 25th, near 40° N., 135° W. It was accompanied by a south-southeast gale of force 9.

The North Pacific anticyclone occupied a small region to the southwestward of California. In Asiatic waters the continental anticyclone extended oceanward from the China coast to a little beyond the Nansei Islands.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, January 1940, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	Millibars	Millibars		Millibars	
Point Barrow.....	1,022.0	+3.4	1,047	14	988	10
Dutch Harbor.....	997.8	-3.9	1,021	11	979	22
St. Paul.....	1,001.2	-2.2	1,021	1	984	23
Kodiak.....	1,004.2	+2.2	1,025	11	982	16
Juneau.....	1,012.9	+1.0	1,028	18	987	28
Tatoosh Island.....	1,014.2	-1.1	1,029	14	994	7
San Francisco.....	1,010.9	-2.7	1,025	15	1,005	
Maui.....	1,014.5	+3	1,018	25, 28	1,011	13-15, 18
Honolulu.....	1,011.2	-4.7	1,017	30	1,005	19
Midway Island.....	1,007.7	-9.2	1,016	4	999	31
Guam.....	1,010.8	-1.7	1,015	11	1,004	22
Manila.....	1,012.4	+2	1,016	26	1,009	15
Hong Kong.....	1,018.1	-1.5	1,025	23	1,010	15
Naha.....	1,019.5	+9	1,026	26	1,012	12, 15
Tiijima.....	1,014.5	-1.8	1,021	11	1,005	13
Petrovsk.....	998.8	-5.3	1,013	31	976	12

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Extratropical cyclones and gales.—The storminess of January 1940, was abnormal on the North Pacific Ocean. Except to the eastward of the 140th meridian of west longitude, stormy weather to the northward of the 40th parallel was perhaps the least pronounced of record for a winter month in that great region. In fact, for the entire area north of 35° N., and west of 150° W., only 4 or 5 days with gale winds (force 8 to 10) are to be noted in ships' reports.

On the contrary, over the eastern part of the ocean, from northern United States coastal waters, and extending southwestward broadly along the routes toward the Hawaiian Islands, extraordinarily stormy conditions for any winter month prevailed. Here rather densely distributed gales of force 8 to 10 occurred on no less than 20 days, which appears to constitute a record for gale frequency, particularly to the southward of the 35th parallel in these waters.

Another stormy region was the belt of 30° to 35° N., between the meridians of approximately 145° E. and 160° W. Along this strip the heaviest winds of the month occurred, attaining force 11 on the 9th, 10th, 13th, 17th, and 19th.

In these latitudes while en route from the Philippine Islands toward San Pedro, the Norwegian motorship *Bonneville* had probably the most tempestuous voyage of any ship of the month on the North Pacific Ocean. On January 8 she entered the stormy weather belt near 32° N., 145° E. On the 21st she finally emerged from it, near 32° N., 160° W. During the period the vessel encountered daily gales, as strong as force 10 on the 11th, 12th, 16th, and 20th, and as high as force 11 on the 9th, 10th, 17th, and 19th. The lowest barometer read on the *Bonneville* during the voyage was 985.4 millibars (29.10 inches) occurring on the 18th, in 32°30' N., 168°14' W.

Along the immediate coast of the United States, principally off Washington and Oregon, ships reported gales on the 1st, 3d, 4th, 7th, 24th, 25th, and 26th, all of force 9 except that of the 7th, southeast, force 8, and that of the 3d, southeast, force 10, both off the coast of southern Oregon. These gales occurred in connection with cyclones centered at some distance to the westward.

Tehuantepecers.—There was considerable wind activity in the Gulf of Tehuantepec during January, with Tehuantepecers reported on 9 days, as follows: Of force 8 on the 8th, 20th, and 25th; of force 9 on the 16th, 23d, and 24th; and of force 10 on the 15th, 27th, and 28th.

Fog.—Fog was reported altogether along the northern routes between 180° and 133° W. on 8 days, during the period from the 18th to the 29th. Along the California-Hawaiian routes, exclusive of coastal waters, there were 9 days with fog, scattered through the month. In California coastal waters ships reported fog on 9 days, and in northern Lower California waters, on 1 day.

ADDITIONAL NOTE ON THE MEXICAN WEST COAST CYCLONE OF OCTOBER 23-25, 1939

By WILLIS E. HURD

In the MONTHLY WEATHER REVIEW, October 1939, under the heading "North Pacific Ocean," mention was made that a tropical cyclone occurred off the Mexican west coast on October 23-25, 1939, and that the American steamer *Nevadan* was reported severely battered by the storm off Manzanillo.

In the issue of the United States Department of Commerce Bureau of Marine Inspection and Navigation Bulletin for December 1939, is quoted the report of Capt. J. H. Masse, of the *Nevadan*, on the ship's experiences in the cyclone while northbound for Los Angeles.

At 6:35 p. m. of October 24 the vessel had Manzanillo Bay light abeam. At 8 p. m. warning was received from San Francisco of a tropical disturbance centered near and southwest of Manzanillo. At 11 p. m., in a fresh gale and noticeably falling barometer, the ship turned left for sea room. Quoting from the captain's report, beginning with 1 a. m. of the 25th:

From one o'clock on the barometer dropped fast. Between four and five a. m. it dropped 1.3 inches to 28.00 and at 5:30 a. m. reached as low as 27.40. The center was passing over the ship. Wind and rain let up, but mountainous seas continued to roll in from all sides * * *.

Immediately the storm center had passed, winds came in once again of hurricane force, with the attending mountainous seas. Visibility was nil; in fact, breathing without a towel over one's nose was difficult, the air was so saturated with sea water. With the great difference of pressure within the ship as against the pressure without and the added impetus of hurricane winds, tar-

paulins on No. 2, 5, 6, and 7 hatches burst open and in some cases blew away, thus allowing the sea water to find itself into the ship. * * * we were on our course for Los Angeles at 9:25 a. m.

The barometer from which the reading of 27.40 inches was taken was carefully tested for temperature and pressure by the Weather Bureau office at San Francisco late in January 1940, and the result indicated that the minimum reading of 27.40 was .05 too low. In accepting 27.45 inches (929.6 millibars) as the correct figure, it remains outstanding as the lowest barometer reading on record in connection with a tropical cyclone occurring in southeastern North Pacific tropical waters.

NOTE.—A report received from the master of the *Nevadan* since the preparation of the foregoing text gives 20° N., 106°21' W., as the approximate position of the ship at time of lowest barometer.

THE APPROACH OF A GULF OF MEXICO NORTHER JANUARY 19, 1940

By WILLIS E. HURD

During the 19th of January 1940, a strong anticyclone, central over Texas, descended rapidly over the Gulf of Mexico, accompanied by subfreezing temperatures along the Texas coast and strong norther winds over the western and central Gulf.

At local noon of the 19th the American steamer *Antinous*, Colon toward New Orleans, was in latitude 21°44' N., longitude 86°14' W., with a northwest wind of force 1, barometer 1,015.9 millibars (30 inches), air temperature 82°, sea temperature 80°, weather fine and clear with a few scattered cumulus clouds, and smooth sea. D. Bolhuis, Second Officer on ship—Capt. C. Reed, Master—sent the Weather Bureau an interesting special report on the meteorological conditions attending the burst of the norther over the southeastern Gulf during the afternoon of the 19th and of its continuance during the forenoon of the 20th. Said Mr. Bolhuis:

At 3 p. m. (C. S. T.) dark clouds were observed on the northern horizon to east and west. By 3:15 p. m. they were advancing rapidly and heavy rain was observed. At 3:25 p. m. the norther struck the vessel, with wind from the northwest, force 5, and very heavy rain squalls; barometer steady at 29.97 inches (1,014.9 millibars); temperature of air 76° and sea at injection, 80°. Vessel steering from noon toward the north-northwest (true) at 13 knots. Heavy rains and steady northwest wind, force 5, continued until 8 p. m., then veering to north-northwest to north, force 6. Overcast with heavy rains, and short, choppy, rough sea and swell. At midnight the sky was overcast, with barometer rising steadily and reading 30.12; temperature of air 66° and of sea at injection 78°.

January 20, midnight till noon: Wind north, force 6, decreasing to force 5 at noon. Very little rain and barometer rising steadily to 30.2 inches (1,022.7 millibars). Noon position by dead reckoning, latitude 25°49' N., longitude 87°50' W.; temperature of air 55° and of sea at injection, 78°.

The sea seemed to be at its choppiest and roughest in latitude 23°21' N., longitude 87°03' W., near the 100-fathom curve off the northern coast of Yucatan.

LATE REPORT

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST, DECEMBER 1939

BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Typhoon. November 29–December 5, 1939.—This typhoon first appeared about 150 miles south of Yap, apparently well developed, indicating that it most likely formed far to the east of that locality some time previously. From its position south of Yap it moved along a west-

northwesterly course, gradually inclining to the northwest. It crossed Samar passing over the southern and central portions on December 2. It continued along this northwesterly course, the center fortunately moving over the water instead of over the islands, for example avoiding Masbate Island and Sorsogon Province. The center moved along the length of Ragay Gulf and crossed Camarines Norte as it inclined to the north, all the time decreasing in intensity and moving slowly. After December 5 it recurved to the northeast as a weak disturbance which soon disappeared over the ocean east of Luzon.

The newspapers of December 9 reported that the total loss of life due to this typhoon, according to reports received, was 34, all from Masbate Island where the rivers rose suddenly because of the heavy rains. There was great property damage along the course of the center, all due to floods and wind.

The barometric minima received from the stations of Samar, Masbate, and southern Luzon show that the storm was weakening as it progressed over the Archipelago. Borongan, Samar, had 730.50 millimeters (974.9 millibars) as its lowest pressure at 2 p. m. December 2, with southeast winds of force 4. Guiuan, Samar, reported 737.94 millimeters (983.8 millibars) with south winds force 9 at 11 a. m. of the same day. Late in the afternoon of December 2, the center passed between Catbalogan and Calbayog, Samar Island. The minima experienced at these stations were 732.91 millimeters (977.1 millibars) for Catbalogan and 731.64 millimeters (975.4 millibars) for Calbayog. Masbate had 731.65 millimeters (975.5 millibars) as its minimum, with winds from the northwest, force 1, during the morning hours of December 3. At Atimonan, Tayabas Pr., 744.03 millimeters (991.9 millibars) was reported as the minimum, with winds of force 7 from the north-northeast, December 4, at 4 a. m. At almost all of these stations, winds of force 10 to 12 were reported as the storm moved past the locality.

On the days preceding November 29, the upper winds over Guam showed the presence of a rather strong east quadrant current, backing from east-southeast to east-northeast, and with velocities as high as 50 kilometers per hour (Nov. 27). Most of these ascents were short and they do not give a very complete picture of the activity aloft. But after November 28 a strong east-southeast and southeast current set in, with velocities as high as 80 kilometers per hour. The Netherlands East Indies stations showed the presence of an extensive southwesterly and westerly current of air flowing toward the typhoon center. Menado was an excellent station for showing that the typhoon was intense. Although the reports were not received every day, yet there were enough to show the presence of a western and southwest quadrant current (depending upon the altitude) over the station, with velocities of 50 kilometers per hour and over at many levels. During these days, as the center approached the Philippines, Zamboanga did not have any definite southwesterly current until after December 1, when the pilots first indicated the approach of air from equatorial regions. After December 2, both Zamboanga and Cebu were in the southwest sector of the storm, with only a few short ascents being made. Manila and the stations of northern Luzon, however had north quadrant winds, strong and persistent. There were some ascents that showed velocities to be 100 kilometers per hour and over, while the usual values reported were between 50 and 80 kilometers per hour. There